EPA's Review of the National Ambient Air Quality Standards for Ozone

Erika Sasser
Office of Air Quality Planning and Standards, U.S. EPA

NTAA Tribal Air Call
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Overview

- Schedule for ozone NAAQS review
- Highlights of new scientific evidence on ozone impacts
  - Health effects evidence
  - Welfare (environmental) effects evidence
- Clean Air Scientific Advisory Committee (CASAC) conclusions and recommendations
- EPA staff conclusions and recommendations

Ozone NAAQS Review Schedule

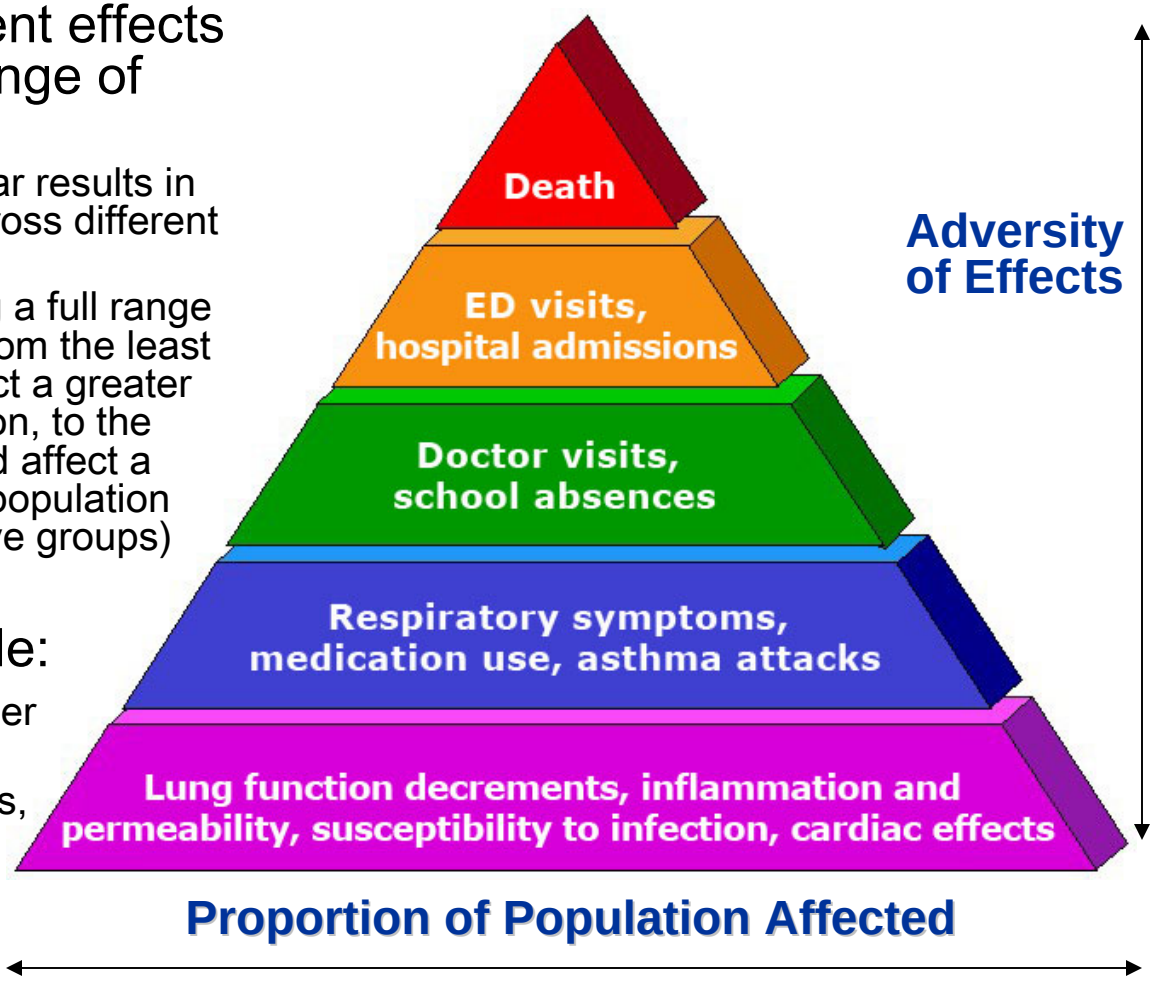
- Criteria Document: March 2006
- Staff Paper: January 31, 2007
- Proposed Rule: June 20, 2007
  - 90-day public comment period: July-September 2007
  - Public hearings: late August 2007
- Final Rule: March 12, 2008

New Health Evidence in This Review

- Significant number of new studies support findings of 1997 review and indicate that ozone may be harmful at lower levels than previously thought
  - New controlled human exposure studies of healthy young adult volunteers done in chambers provide compelling evidence for an array of respiratory effects (e.g. decline in lung function, increased respiratory symptoms, susceptibility to infection) caused by O_3 at levels as low as 0.060 ppm
  - New epidemiological studies, including powerful new multi-city studies, strengthen our confidence in findings of previous review and identify important new health endpoints
    - Studies improve our understanding of respiratory effects seen in 1997 review, such as lung function decline, respiratory symptoms, hospital admissions, emergency department visits
    - New studies also provide evidence of additional health impacts, including mortality, increased asthma medication use, school absenteeism, and cardiac-related effects
    - Multi-city studies which evaluate large numbers of people in different parts of the country and control for a variety of factors (e.g. other pollutants in the air, personal habits such as smoking) increase our certainty that the effects we are observing are attributable to ozone
    - Also have some individual studies that specifically evaluated effects in sensitive groups such as outdoor workers, athletes, the elderly, hikers, school children, and asthmatics
  - No clear evidence regarding threshold: if a population threshold does exist, likely well below level of current standard and possibly within range of background concentrations
  - Studies of asthmatics indicate that they experience larger and more serious responses to ozone, so studies of healthy subjects likely underestimate O_3-related effects on asthmatics and other sensitive groups

Ozone Health Effects Overview: "Pyramid of Effects"

- Consistent and coherent effects seen across a wide range of health outcomes
  - Consistent effects -- similar results in different locations and across different types of studies
  - Coherent effects -- finding a full range of related health effects from the least serious, which would affect a greater proportion of the population, to the most serious, which would affect a smaller proportion of the population (primarily those in sensitive groups)
- Sensitive groups include:
  - Asthmatic children and other people with lung disease
  - All children and older adults, especially people active outdoors
  - Outdoor workers



Human Health Exposure and Risk Assessments

- Exposure and risk assessment models provide additional insights on the number of people potentially affected by O_3 at different levels of air quality
- In this review, EPA focused on a estimating a range of health risks in 12 urban areas
  - Cities included: Atlanta, Boston, Chicago, Cleveland, Detroit, Houston, Los Angeles, New York City, Philadelphia, Sacramento, St. Louis, Washington D.C
  - Health endpoints: lung function decrements, respiratory symptoms, hospital admissions, mortality
- Exposure/risk assessments are intended to illustrate effects in example locations: they do not capture national scale public health impacts or quantify the full range of O_3-related adverse health effects
- CASAC and EPA staff concluded that a significant decrease in risk can be achieved by tightening the standard

Welfare Effects: Vegetation

- New studies strengthen conclusions from 1997 review:
  - Current ozone standard focusing on 8-hour exposures may not be suitable to protect vegetation (crops and trees)
  - Plant response to O_3 depends on both cumulative nature and level of exposure; therefore, studies have focused on measuring impacts cumulatively over longer time periods (e.g., throughout summer ozone season)
  - Current ambient concentrations in many areas of U.S. are sufficient to impair growth of numerous species of crops and trees; problem exists even in areas that attain the 1997 8-hour ozone standard
  - O_3 effects on sensitive tree species, including loss of vigor and competitive advantage, could have implications for ecosystems (e.g., susceptibility to disease or invasive species)

Clean Air Scientific Advisory Committee (CASAC) Conclusions and Recommendations

Primary Standard

- CASAC unanimously concluded: "no scientific justification for retaining" current standard; standard "needs to be substantially reduced to protect human health, particularly in sensitive subpopulations"
- CASAC "*unanimously recommends that the current primary O_3 NAAQS be revised and that the level that should be considered … be from 0.060 to 0.070 ppm*"
  - Recommended specifying standard level in terms of parts per *billion*

Secondary Standard

- *"There is a clear need for a secondary standard which is distinctly different from the primary standard in averaging time, level and form."*
  - CASAC recommended a specific cumulative form that would extend over the entire growing season to capture biological impacts

Final EPA Staff Conclusions

Primary Standard

- Staff recommended that the standard should be tightened to afford greater public health protection, especially to sensitive groups, including asthmatic children and other people with lung disease, as well as all children and older adults, especially those active outdoors, and outdoor workers
- Staff concluded it is appropriate to consider a range of levels from somewhat below 0.080 ppm down to 0.060 ppm O_3

Secondary Standard

- Staff stated that the current daily maximum 8-hr average form should be replaced with a more biologically relevant form based on cumulative exposure
  - Staff concurred with CASAC in recommending a form which sums daily weighted O_3 values over a consecutive 3-month period in ozone season